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ON THE BLACK BALSAM OF PERU.

BY DR. THEODOR MARTIUS,
Professor in the University of Erlangen.

(In a Letter to Dr. Pereira).

MY VERY ESTEEMED FRIEND,—I have read with great pleasure your interesting article on Black Peruvian Balsam†, and although no one is better circumstanced than yourself, both by your extensive connexions, and by your residence in the emporium of the world, to enlarge our knowledge on subjects like these, yet as there are some points in your treatise which it appears to me well deserve further investigation, and as both of us are animated with the desire of elucidating the truth, I do not hesitate to draw your attention to the following circumstances:

The method of obtaining black Peruvian balsam has always been a subject of controversy. When my late friend *Stoltze*, published in the year 1824, his *Treatise on the Black Peruvian Balsam*, I could not convince him that the balsam is obtained by a sort of *distillatio per descensum*, and not by decoction or spontaneous exudation as he stated. I find my opinion corroborated by what you state in your article, but that the balsam should, by boiling the rags in water, rise to the surface, and thus be removed, is impossible, for it has a specific gravity of from 1.150 to 1.160, and cannot, therefore, float on water by boiling. If a solution of common salt, that is to say, a liquid of a greater spec. grav. were employed, the balsam would then certainly float, but at the same time its agreeable odour would probably disappear, in consequence of the high temperature required for boiling the saline solution. As moreover, the cinamic acid contained in the black balsam is soluble in water, the greater portion of this acid would be given out to the liquid employed for the exhaustion of the rags. I must confess, that now and then, single drops of water, and sometimes even entire layers of water, as thick as the back of a knife, were supernatant in the tin boxes, in which formerly the black Peruvian balsam was exported; but this trifling portion of water I have always considered to be the product of *distillatio per descensum*, and have never found in it by evaporation, anything but cinamic acid (formerly regarded as benzoic acid). Moreover, whence arises in many of the tin boxes the sediment of several fingers' height found in them after remaining at rest? Furthermore, what is the reason that the *tinctura balsami Peruviani* is sometimes of a lighter, and sometimes of a darker wine-yellow colour, according as it is prepared from a lighter or darker coloured balsam? I think this originates from the higher or lower degree of heat employed in the *distillatio per descensum*. I must also observe, that several years ago, a sort of black Peruvian balsam was in the market, which, on running down the glass, appeared of a reddish-brown colour, was more fluid, and yielded, even after continued standing, a proportionately very insignificant sediment. All this tends to show, that besides the various kinds of *Myrospermum* used for yielding the balsam, the higher or lower degree of heat employed in its preparation, must contribute to vary the quality of the balsam obtained.

Stoltze says in his article (*Berlinisches Jahrbuch*, 25 Jahrgang, Abtheil. 2, p. 25), that he has never observed in his operations the products of a descending distillation, but there is a great difference between such a process and a gentle *distillatio per descensum*. Moreover, it must not be forgotten, that the plants which

† See the *Pharm. Journ.* vol. x., pp. 230 and 280.—*Ed. Pharm. Journ.*

yield the black Peruvian balsam, grow in a country which is in the highest degree favourable to the exudation of resinous juices from vegetables. Besides, the formation of cinnamic acid takes place, as it appears, only by the absorption of oxygen or by an increased temperature. How do you account for the presence of this acid in the balsam, and that in such large proportion?

As it is my great desire to have all these matters explained, I applied to Bordeaux, which town carries on a considerable trade in black Peruvian balsam; and the following is the answer of my friend, dated July the 27th:—

“Balsamum Peruvianum nigrum is generally exported from Sonsonate and Ajautla (Central America) in jars, and is mostly transferred in Europe into tin-boxes, when it is at the same time deprived of water, mucilage, and salt, which I generally effect in a bathing-tub. For some time past the English have begun to take possession of this article, and import it from the eastern part of Central America, by way of Belise or Greytown. One of our captains, who formerly imported 200 jars of balsam, saw them being filled, and was not a little astonished on finding here that water had separated during the voyage. In a fresh state the balsam is more greenish and more fluid than after having been kept for some time, when it flows with a golden brown colour, and runs down the glass with a reddish colour. White Peruvian balsam I have never seen; but I saw the fruit-capsules of the Peruvian balsam-tree, which were very resinous, and might, perhaps, yield a white or pale elemy-yellow coloured balsam.” Thus far my friend.

From his communication it appears,

1. That black Peruvian balsam sold retail, has already undergone a purification.
2. That the Peruvian balsam, as imported from America, contains water, mucilage, and salt; and
3. That the balsam in a fresh state is not only more fluid, but likewise possesses a greenish colour.

But at the same time, all that I have now stated about this subject tends to show that we are not yet perfectly acquainted with the method of obtaining the balsamum Peruvianum nigrum. I should be very glad to find that my observations have been the cause of further investigation on this subject.

I take at the same time the liberty to direct your attention to the fact, that in the work of Hayne (volume xv. ?) there are two figures of Myroxylon, of which one differs from the plant which you had the kindness to show me.

My dear Friend,

Your most obedient humble Servant,

DR. THEODOR MARTIUS.

London, 3rd October, 1851, 27, Trinity Square, Tower Hill.

(DR. PEREIRA'S REPLY).

Finsbury Square, October 25, 1851.

MY DEAR DR. MARTIUS.—Your remarks respecting the relative specific gravity of the balsam of Peru and water, and the consequent impossibility that the balsam should float on the water, are quite correct; and I have no doubt that the statement should be reversed, and that the water floats on, and therefore, must be skimmed off the balsam. Indeed, within the last few days, Mr. Skinner has shown me a paper written in Spanish, on the dictation of a native Indian, in which it is so stated.

That heat is employed in the preparation of the balsam is stated in Mr. Klée's letter appended to my former paper. But this gentleman merely says that the natives “burn the outside [of the bark of the tree] slightly.” This scarcely amounts to a “*distillatio per descensum*.” Mr. Skinner, however, tells me that when he was in Guatemala, he was informed that the balsam was obtained thus: A fire was made around, but at some little distance from the balsam tree. The bark was then cut, and a stick was slipped in between the bark of the tree and the wood, so as to partially separate these two parts of the stem from each other. By working the stick about, somewhat in the manner of a pump-handle, the balsam, aided by the heat, exuded, and was absorbed by rags.

The pale wine-yellow coloured balsam of Peru, as well as the greenish balsam, alluded to in your letter, I am unacquainted with.

The turbid aqueous liquid which you and I, in company with Mr. Skinner, obtained at the London Docks, and which we were told had been drawn from a jar containing balsam of Peru, has, I find, an agreeable balsamic odour, an acrid balsamic taste, and a specific gravity of 1.020 at 64° Fahr. This greater density than water can be owing in a very minute degree only, if at all, to the presence of common salt; for, although on the addition of a solution of nitrate of silver, the liquid becomes very turbid owing to the formation of a white precipitate, yet as nitric acid dissolves this precipitate and renders the solution clearer than it was before the addition of the nitrate, it is obvious that a very minute portion only of any chloride can be present. The liquid reddens blue litmus paper, owing, doubtless, to the presence of cinnamic acid.

The only purification to which balsam of Peru is subjected in England is one of a mechanical kind, that is, by standing the balsam is allowed to separate from the water and any other impurities, and is then drawn off.

Believe me to be, my dear Dr. Martius,

Faithfully yours,

JONATHAN PEREIRA.

Dr. Theodor Martius, Professor in the University of Erlangen.

P.S. I am indebted to Mr. Skinner for the following note respecting the extraction of balsam of Peru.

Mr. Saravia, of Sonsonate, having been requested to question the Indians respecting the production of balsam, replied, under date November 25, 1849:—

“The manner used to extract the balsam from the trees, is to make several incisions in the tree, over which they place pieces of old cloth or rags, which absorb the juice, which when they observe to be well soaked, they put in water to boil, until the rags have discharged the greatest part of the balsam which they had imbibed. They then allow it to settle sufficiently until the water rises, leaving the balsam at the bottom; they pour off with care the water, afterwards filling ‘*tecomates*’ (gourds) with the balsam, although it is not now very pure. The rags are then put into ‘*redes*’ (little bags of cords), which when strongly twisted wring any remaining balsam out of them into the ‘*tecomates*.’ When we purchase it, it is necessary to clean it again, because it still contains water and other impurities, which some Indians will mix with it to gain greater weight, and which some practise. I have the trunk of the tree, branches, and seeds ready to send off for you, but it is not now flowering season, and you must wait another occasion.

“The drawing you ask for is very difficult, because the Indians would not allow it. They are very subtle and wanting confidence, and would believe us engaged in something which might be prejudicial to them; besides, I know no one capable who could go to the villages of the coast and do it.

“The white balsam is not known here, and the only one known here is one which the Indians make, by breaking the seeds, and collecting one or two drops which they find within, and to which they give the name of *balsamo virgen*; its colour is that of *French olive oil*, all the virtue of this you have in the balsamito.”

